

# Traffic Calming Toolbox

[www.stpaul.gov/trafficcalming](http://www.stpaul.gov/trafficcalming)

“...Combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users.”

– Institute of Transportation Engineers

# Traffic Calming Treatment

- Where can you use them?
- Why would you use them?
- How effective are they?
  - \*Effectiveness reflects the professional opinion of City staff, based on available research and engineering best practices
- What are the drawbacks?
- What is the maintenance cost?
  - \*All costs are approximate
- How much do they cost?
  - \*All costs are approximate

# Bump outs

Curb extensions at intersections that reduce curb-to curb roadway travel lane widths.

St. Clair/Milton;  
St. Paul, MN

# Bump outs

- Where can you use them?
  - Intersections and mid-block
- Why would you use them?
  - Haven for pedestrians waiting to cross the street
  - Shorten crossing distance
  - Restricts street width which slows traffic
  - Provide space for amenities (trees, garden, etc.)
- How effective are they?





# Flasher with pedestrian push button activation

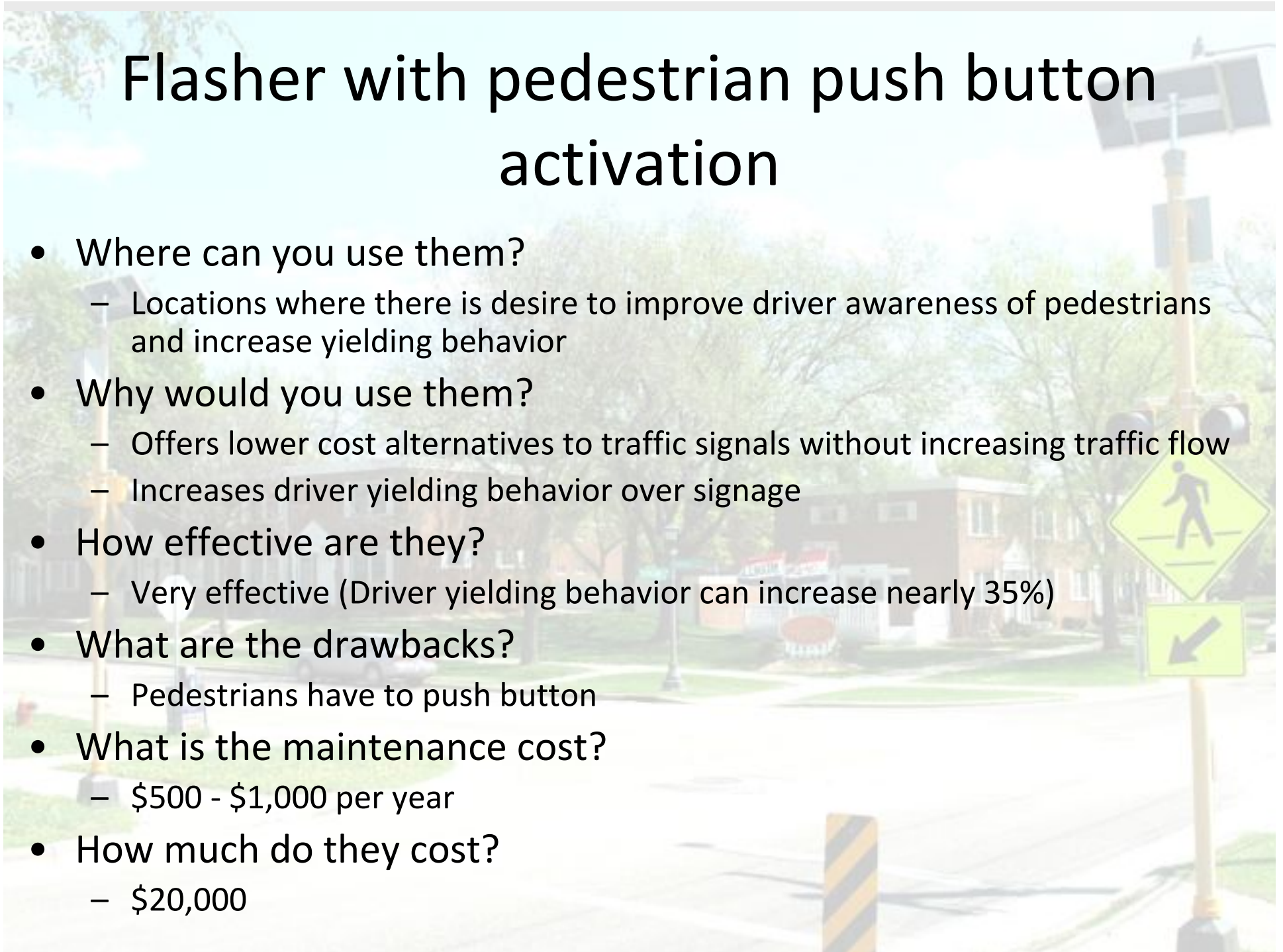
Warning device that flashes when a pedestrian pushes the button, alerting vehicles.

Cleveland/Montreal;  
St. Paul, MN



# Flasher with pedestrian push button activation

- Where can you use them?
  - Locations where there is desire to improve driver awareness of pedestrians and increase yielding behavior
- Why would you use them?
  - Offers lower cost alternatives to traffic signals without increasing traffic flow
  - Increases driver yielding behavior over signage
- How effective are they?
  - Very effective (Driver yielding behavior can increase nearly 35%)
- What are the drawbacks?
  - Pedestrians have to push button
- What is the maintenance cost?
  - \$500 - \$1,000 per year
- How much do they cost?
  - \$20,000





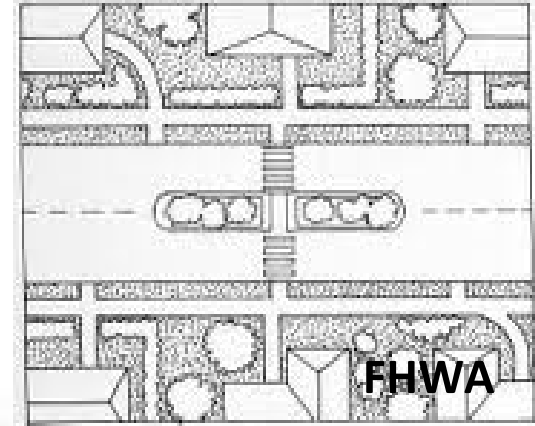
# Midblock Median

Raised islands located at the centerline of a street.

Otis Avenue; St. Paul, MN

# Midblock Median

- Where can you use them?
  - Along the centerline of a street
- Why would you use them?
  - Reduce crossing distance for pedestrians
  - Slow traffic
  - Break up the view of the street
- How effective are they?
  - Anecdotal evidence suggests they are effective at reducing speeds
- What are the drawbacks?
  - Ban parking in the area of the median
- What is the maintenance cost?
  - \$450 per year maintenance of plantings
- How much do they cost?
  - \$20,000 - \$75,000





# Pedestrian Warning Sign with Flashing LED Lights



Nicollet Blvd.  
Burnsville, MN

# Pedestrian Warning Sign with Flashing LED Lights

- Where can you use them?
  - Locations where there is desire to improve driver awareness of pedestrians and increase yielding behavior
- Why would you use them?
  - Offers lower cost alternatives to traffic signals without increasing traffic flow
  - Increases driver yielding behavior over signage
- How effective are they?
  - Unknown. This is a newer technology, so would serve as a pilot study.
- What are the drawbacks?
  - May add to visual clutter
- What is the maintenance cost?
  - Unknown since they are a new technology using solar power
- How much do they cost?
  - \$10,000



# Refuge island

Raised median which facilitates crossings of busy streets by providing a space in the center of the roadway for bicyclists or pedestrians to wait for gaps in traffic. Refuges also reduce potential crashes by restrict left-turn movements.

40<sup>th</sup>/Chicago  
Minneapolis, MN



# Refuge island

- Where can you use them?
  - Intersections with arterial streets
- Why would you use them?
  - Allows pedestrians and bicyclists to more comfortably cross streets
  - Provides protected space for users to wait for a gap in traffic
  - Reduces the overall crossing length
  - Calms traffic by physically narrowing roadway and limiting turning movements
  - Reduces through traffic on intersecting roadway
- How effective are they?
  - Very effective
- What are the drawbacks?
  - Driver turning movements will be limited
  - In the short term may move traffic onto adjacent streets
- What is the maintenance cost?
  - \$500 per year snow clearing
  - \$450 per year maintenance of plantings
- How much do they cost?
  - \$20,000-\$75,000



# Roadway art

Roadway murals which promote community and placemaking through public art. These pavement markings encourage road user awareness.

Englewood/Syndicate; St. Paul, MN



# Roadway art

- Where can you use them?
  - Residential streets
- Why would you use them?
  - Alert drivers to drive with caution
  - Create community building through act of painting
  - Create public art
- How effective are they?
  - Modestly effective at traffic calming
  - Effective at community building
- What are the drawbacks?
  - Require annual community-led effort to repaint
- What is the maintenance cost?
  - The cost of annual painting.
- How much do they cost?
  - According to current policy, the City does not participate in cost share for roadway art



# Sharrow



Jefferson/Hamline;  
St. Paul, MN

Pavement marking with a bike symbol and arrow graphic to indicate a shared bike-vehicle route. These symbols raise awareness of all users and help cyclists better position themselves on roadways.

# Sharrow

- Where can you use them?
  - Roadways classified as local residential
- Why would you use them?
  - Provides bicyclists with information relative to their position on the road
  - Provides information to motor vehicles to expect bicyclists on the road
  - Informs all users that the roadway is a bikeway
  - Improved safety for bicyclists
- How effective are they?
  - Very effective
- What are the drawbacks?
  - Require periodic repainting
- What is the maintenance cost?
  - Two types of application: poly preform (lasts 5-7 years) and paint (lasts 1-2 years)
- How much do they cost?
  - Poly preform: \$30-\$60 per year annualized
  - Paint: \$50 per year



## Signage and wayfinding



Signs of varying types placed along the route. These signs can provide identification information to users that the road is a bicycle boulevard and also provide directional information to identify turns and proximity to destinations.



# Signage and wayfinding

- Where can you use them?
  - Within public right-of-way along bicycle network
- Why would you use them?
  - Familiarizes users with the bicycle network
  - Identifies the best routes to destinations
  - Visually indicates to motorists that they are driving along a bike route and to use caution
  - Provide information to road users
- How effective are they?
  - Very effective
- What are the drawbacks?
  - Too much signage may increase visual clutter
- What is the maintenance cost?
  - Manufacture and replace signface every 15 years
- How much do they cost?
  - \$250/each



miles

1.0

1.5

3.7

# Speed display sign



Radar speed signs that provide driver feedback on speed of travel and effectively reduce speeds on the section of roadway on which they are placed.

Edgcumbe Road west of Lexington Pkwy.



# Speed display sign

- Where can you use them?
  - Collector or arterial roadways
- Why would you use them?
  - Alert drivers to personal speed in relation to speed limit
  - Reduce speeding
- How effective are they?
  - Very effective
- What are the drawbacks?
  - Too much signage may increase visual clutter
- What is the maintenance cost?
  - Minimal
- How much do they cost?
  - \$10,000-\$15,000 per sign



# Speed humps

Flat-topped speed humps to slow traffic.

Otis Avenue north of  
Marshall Ave; St. Paul, MN

# Speed humps

- Where can you use them?
  - Local residential streets
- Why would you use them?
  - Can effectively slow traffic to 15-20 mph without making drivers uncomfortable
- How effective are they?
  - Moderately effective
- What are the drawbacks?
  - Consideration needed for buses and emergency vehicles
  - Requires parking ban
  - Frequent placement so that acceleration between humps is minimized
  - Neighborhood noise issue
  - In past experience, neighbor feedback indicates they are a nuisance
- What is the maintenance cost?
  - Minimal
- How much do they cost?
  - Asphalt: \$2,000
  - Concrete: \$5,000



# Traffic circle

Raised circular islands located in the center of an intersection, directing all traffic in the same direction. Stop signs at the intersection are removed.

Charles/Albert; St. Paul, MN



# Traffic circle

- Where can you use them?
  - Residential streets and intersections
- Why would you use them?
  - Physically slow traffic
  - Eliminates non-compliance issue at stop signs
  - Sustained lower vehicle speeds through intersection
  - Provide space for enhancements (e.g., gardens, etc.)
  - Improves through movement for bikes
- How effective are they?
  - Decrease vehicle conflict by 75%
  - Decrease pedestrian conflict by 67%
  - Decreases severity of vehicle-vehicle accidents
  - Eliminates t-bone crashes (most deadly)
- What are the drawbacks?
  - More difficult for snow plowing than traditional intersection
  - Under current policy, residents required to maintain plantings
- What is the maintenance cost?
  - \$450 per year for maintenance of plantings
- How much do they cost?
  - \$10,000-\$15,000

You may be surprised these aren't in  
the traffic calming toolbox...

- Stop Signs
- Traffic Signals

# Stop Sign



Traffic control signage, directing facing traffic to come to a full and complete stop.



# Stop Signs

- Where can you use them?
  - Intersections
- Why would you use them?
  - To control traffic
  - Locations with specific hazards (e.g., sight line issue)
  - Lower volume street intersecting with a higher volume street
- How effective are they?
  - Effective at controlling traffic, when “warranted” according to MUTCD
  - When used elsewhere accident rates increase
- What are the drawbacks?
  - Speeds are reduced at intersections, but increase midblock
  - Diversion of traffic is not achieved
  - Low compliance
  - Noise and air quality issues from accelerating and decelerating vehicles
  - Creating a false sense of security
- What is the maintenance cost?
  - Replace sign face every 15 years at approximate cost of \$50 - \$100
- How much do they cost?
  - \$250/each

# Traffic signal

Intersection control device that assigns right of way to the user.

Jefferson/Fairview; St. Paul, MN



# Traffic signal

- Where can you use them?
  - Intersections of arterial streets
- Why would you use them?
  - To increase the efficiency of an intersection or corridor.
  - To accommodate other users at the intersection.
  - To mitigate high crash rates.
- How effective are they?
  - Provide for the orderly movement of traffic
  - Increase the ability of the intersection to handle more traffic
  - Decrease the severity and frequency of accidents at high accident locations
  - In a coordinated system can provide continuous, or nearly continuous, flow of traffic
  - Can interrupt heavy traffic flows to allow others modes, i.e. pedestrians, to cross the intersection
- What are the drawbacks if incorrectly designed and implemented?
  - Can cause excessive delay
  - Noncompliance of the signal can occur
  - Can increase traffic on intersecting, lower-volume street
  - Can decrease intersection safety.
- What is the maintenance cost?
  - \$4,000 per year
- How much do they cost?
  - Approx. \$250,000 (Because these are “not warranted” along Jefferson according to the Minnesota Manual on Uniform Traffic Control Devices, federal dollars could not be used and the City would need to pay the entire cost of the signal)



# Local Examples of Traffic Calming

- Bike Boulevards (all in Minneapolis):
  - 5th Street NE and SE (including 26th Avenue NE)
  - 22nd Avenue NE (including Arthur St NE)
  - 40th Street E (RiverLake Greenway)
  - Bryant Avenue S
  - Fillmore/Polk/Tyler Streets NE (including 6th Avenue SE)
- Traffic Circles (all in Saint Paul):
  - Macalester & Stanford
  - Wheeler & Wellesley
  - Albert & Portland
  - Laurel & Saint Albans
  - Finn & Lincoln
  - Albert & Charles
  - Fry & Shields
  - Shields & Wheeler
  - Wilder & Iglehart

# References

- Apple Valley 's *"Stop signs are they right for your neighborhood?"* brochure
  - <http://www.ci.apple-valley.mn.us/DocumentView.aspx?DID=418>
- Accommodating Bicycle and Pedestrian Travel: A Recommended Approach
  - <http://www.fhwa.dot.gov/environment/bikeped/design.htm>
- AASHTO
  - <http://www.transportation.org/>
- Effectiveness of Stop Signs for Traffic Calming
  - <http://troymi.gov/traficengineering/multiway.htm>
- Mn/DOT Bike Facility Design Manual
  - <http://www.dot.state.mn.us/bike/designmanual.html>
- MUTCD
  - <http://www.dot.state.mn.us/trafficeng/publ/mutcd/index.html>
- NACTO Urban Bikeway Design Guide
  - <http://nacto.org/cities-for-cycling/design-guide/>
- Project for Public Spaces
  - <http://www.pps.org/articles/livememtraffic/>
- Safety and Stop Signs
  - [http://safety.fhwa.dot.gov/interseciton/resources/fhwasa10005/brief\\_4.cfm](http://safety.fhwa.dot.gov/interseciton/resources/fhwasa10005/brief_4.cfm)
- Traffic Calming
  - <http://www.ite.org/traffic/tcstate.asp>
  - <http://www.ite.org/traffic/tcstate.asp>
  - <http://www.ite.org/traffic/tcsop/Chapter3a.pdf>
  - <http://www.fhwa.dot.gov/environment/sidewalk2/sidewalks209.htm>